Standards & Measurement Criteria

Agricultural Business Management-Agriscience

Power, Structural, & Technical Systems - Option E

SAE and FFA Integrated Skills (Options A-G)

CIP No. 01.0100

These standards are to be integrated into all courses within this program and not taught separately.

1.0 DEVELOP A PLAN FOR A CAREER IN AGRICULTURAL BUSINESS AND MANAGEMENT

1.1 Analyze the variety of career options in: agribusiness systems; animal systems; environmental service systems; food products & processing systems; natural resource systems; plant systems; and power, structural & technical systems

1.2 Develop career goals based on interests, attitudes and research, and record in the long-ranged annual Supervised Agricultural Experience (SAE) program plan

1.3 Write, review and revise plan/goals through an annual long ranged SAE program plan

1.4 Manage personal and career goals through an annual long ranged SAE program plan

1.5 Describe factors that contribute to job satisfaction & success

2.0 PREPARE FOR EMPLOYMENT IN AGRICULTURAL BUSINESS AND MANAGEMENT

2.1 Develop a resume and sample cover letter utilizing data from the SAE Record and Planning book and from the Job Interview CDE

2.2 Create a personal portfolio with industry-specific work samples

2.3 Complete a job application process, including electronic applications

2.4 Demonstrate customer service skills

2.5 Demonstrate interviewing skills utilized in any FFA Career Development Event (CDE)

2.6 Apply researched company/agency information for the purpose of preparing for the interview process

3.0 PARTICIPATE IN SUPERVISED AGRICULTURAL EXPERIENCES [SAE]

3.1 Demonstrate understanding and use of technology appropriate for the SAE or career goals

3.2 Demonstrate workplace leadership and teamwork skills and behaviors

3.3 Demonstrate positive attitudes in person and through communication technology

3.4 Demonstrate positive interpersonal behaviors

3.5 Demonstrate safe and healthy workplace behaviors

3.6 Recognize and adapt to changes in the workplace

3.7 Participate in a variety of SAE paid or non-paid work experiences

3.8 List skills and competencies for selected SAE or career

3.9 Complete Arizona SAE Record and Planning book

4.0 DEMONSTRATE ORAL COMMUNICATION SKILLS

4.1 Through research, collect appropriate topical information and data as would be utilized for any FFA CDE that would require oral communication skills
4.2 Use questioning techniques to obtain needed information from audience
4.3 Interpret verbal and nonverbal communications of audience
4.4 Demonstrate active listening skills
4.5 Demonstrate use of technologies for a formal presentation
4.6 Deliver presentation incorporating verbal and nonverbal communication techniques
4.7 Communicate using effective and suitable language for a diverse audience
4.8 Demonstrate effective telephone techniques
4.9 List appropriate skills for oral customer communication
4.10 Participate in any FFA CDE that requires oral communication

5.0 DEMONSTRATE WRITTEN COMMUNICATION SKILLS

5.1 Through research, collect appropriate topical information and data as would be utilized in any FFA CDE event that would require written communication skills
5.2 Organize information and develop an outline
5.3 Credit sources of information in appropriate written format
5.4 Prepare business communication using appropriate written format for the situation
5.5 Prepare draft document using established rules for grammar, spelling and sentence construction
5.6 List appropriate skills for written customer communication
5.7 Utilize electronic format for written and presentation communications
5.8 Participate in any FFA CDE that requires written communication

6.0 EVALUATE THE ROLE OF AGRICULTURAL BUSINESS AND MANAGEMENT INDUSTRIES IN THE ECONOMY

6.1 Evaluate the roles of agricultural business and management industries in local, state, national and international economies
6.2 Compare and contrast the advantages and disadvantages of sole proprietorships, partnerships and corporations
6.3 Develop a business plan
6.4 Conduct an employee needs analysis for the organization based upon a business plan
6.5 Research business locations, facilities and equipment needs for the organization based upon the business plan
6.6 Analyze the relationship of customer service and customer satisfaction on the success of a business
6.7 Participate in any FFA CDE that requires knowledge or use of business plans, customer service skills and/or customer satisfaction data

7.0 DEMONSTRATE BUSINESS AND FINANCIAL MANAGEMENT PRACTICES NEEDED IN AGRICULTURAL BUSINESS AND MANAGEMENT INDUSTRIES

7.1 Research and identify costs associated with supplying services in the Agricultural Business and Management field
7.2 Interpret financial information for decision making and planning
7.3 Monitor and adjust business operation based on financial performance
7.4 Demonstrate knowledge of checking and savings accounts and the ability to balance a checkbook
7.5 Develop a Risk Management plan for SAE or business
7.6 Utilize the SAE record and planning book to record the business and financial management practices for all SAEs

8.0 EVALUATE LEADERSHIP STYLES APPROPRIATE FOR THE WORKPLACE

8.1 Describe how personal characteristics affect leadership ability
8.2 Investigate and evaluate leadership and management styles
8.3 Describe how cultural and ethnic differences affect leadership styles within a group
8.4 Describe how cultural and ethnic differences affect interpersonal interactions, teamwork and communications within a group
8.5 Describe different business etiquette practices

9.0 PARTICIPATE IN LEADERSHIP ACTIVITIES AS PROVIDED BY THE FFA ORGANIZATION

9.1 Describe roles and responsibilities that FFA leaders and members bring to an organization
9.2 Evaluate characteristics and importance of an effective team player
9.3 Evaluate characteristics of effective teams
9.4 Demonstrate teamwork through participation in CDE teams
9.5 Practice techniques to involve each member of the team
9.6 Practice effective meeting management through participation at FFA meetings
9.7 Develop and implement a personal and professional improvement plan as shown in the SAE Record and Planning book
9.8 Participate in FFA Career Development Events
9.9 Practice decision-making process
9.10 Participate in leadership activities through FFA offices and committees

Applied Biological Systems (ABS) Agriculture

CIP No. 01.0100.10 (Introduction to Applied Biological Systems)
CIP No. 01.0100.12 (Applied Biological Systems)
These standards are to be taught over a two year period during grades 9 and 10.

10.0 DEMONSTRATE LABORATORY PROCEDURES AND SAFETY PRACTICES

10.1 Demonstrate safe practices in a home, classroom, laboratory and work situation
10.2 Identify careers that involve working with hazardous biological materials
10.3 Know the value of safety to employees
10.4 Discuss the impact of safety compliance on business
10.5 Identify safety precautions associated with biotechnology
10.6 Safely operate and maintain equipment

11.0 DESCRIBE ANIMAL HEALTH NEEDS

11.1 Explore the cells, tissues and organs in animals
11.2 Describe the epidermis system
11.3 Describe the musculoskeletal system
11.4 Describe the nervous system
11.5 Describe the circulatory system
11.6 Describe the respiratory system
11.7 Describe the digestive system
11.8 Describe the urinary system
11.9 Describe the reproductive system
11.10 Describe the endocrine system
11.11 Discuss how biotechnology has influenced animal health
11.12 Explain how biotechnology has influenced animal medicines
11.13 Compare the impact of biotechnology on the length and quality of animal life
11.14 Explore careers in the health care field and/or veterinary care field
11.15 Explore benefits to health care that have resulted from advances in technology

12.0 DESCRIBE BASIC PRINCIPLES OF NUTRITION

12.1 Define the essential nutrients
12.2 Explore the nutritional needs of humans
12.3 Explore the nutritional needs of animals
12.4 Explore the nutritional needs of plants
12.5 Explain the process of food digestion
12.6 Describe nutrient absorption
12.7 Identify common nutrient problems
12.8 Compare the impact of biotechnology on the production, processing, storage and preparation of food
12.9 Discuss how biotechnology has improved nutrition
12.10 Explore careers in the field of nutrition

13.0 EXAMINE THE INTERACTION OF BIOLOGICAL SYSTEMS WITHIN THE ENVIRONMENT

13.1 Discuss the different classifications of natural resources in the environment
13.2 Identify fossil fuels found in the environment
13.3 Describe soil resources found in the environment
13.4 Identify the effects of pest control methods on the environment
13.5 Discuss environmental issues related to water resources
13.6 Identify air and atmospheric resources
13.7 Describe the effects of technology and biotechnology on the environment
13.8 Explore careers related to natural resources and the environment
13.9 Describe benefits to the environment as a result of advances in technology

14.0 DESCRIBE PRINCIPLES OF PLANT GROWTH PRODUCTION

14.1 Identify parts of plants and their functions
14.2 Explore methods of classifying plants
14.3 Recognize the physiological needs of plants
14.4 Explain plant reproduction
14.5 Investigate plant tissue culture techniques
14.6 Explore careers that utilize biotechnology skills in the growth and production of plants
14.7 Discuss the effects of plant biotechnology in sustainable agriculture systems

15.0 DESCRIBE PRINCIPLES OF ANIMAL GROWTH AND PRODUCTION

15.1 Recognize the physiological needs of living animals
15.2 Explore animal health control practices
15.3 Explain animal reproduction practices
15.4 Describe the use of biotechnology in animal growth and reproduction
15.5 Explore careers in animal growth and production

16.0 USE SCIENTIFIC PROCESSES TO ANALYZE DATA

16.1 Formulate predictions, questions, or hypotheses based on observations
16.2 Evaluate appropriate resources
16.3 Illustrate the scientific method
16.4 Design and conduct controlled investigations
16.5 Identify new and innovative food products developed as a result of advances in technology
16.6 Analyze data to explain results and propose further investigations
16.7 Design models
16.8 Communicate results of investigations

17.0 ANALYZE THE RELATIONSHIPS WITHIN LIVING SYSTEMS

17.1 Explain the role of the cell and cellular processes
17.2 Examine the molecular basis of heredity and resulting genetic diversity
17.3 Analyze the relationships among various organisms and their environment
17.4 Portray the scientific principles and processes involved in biological evolution
17.5 Analyze the organization of living systems
17.6 Recognize the role of energy within living systems

18.0 DISCUSS BIOETHICAL ISSUES

18.1 Explore the ethical considerations related to using biotechnology to improve human health
18.2 Discuss ethical considerations related to using biotechnology to produce and process human food
18.3 Identify ethical considerations related to using biotechnology to improve the production of animals
18.4 Describe the ethical considerations businesses face when deciding to sell food produced using biotechnology techniques

Laboratory-Based Integrated Science I

CIP No. 01.0100.14

These standards are to be taught during grades 11 and 12. Whichever option is chosen, will affect how these standards are taught.

19.0 DESCRIBE FOOD SAFETY AND PROCESSING PRACTICES

- 19.1 Identify food safety practices
- 19.2 Describe food-processing practices
- 19.3 Examine the effects of biotechnology on food safety and processing techniques
- 19.4 Explore careers in the food industry

20.0 INVESTIGATE ETHICS IN THE AGRICULTURE INDUSTRY

- 20.1 Assess ethics
- 20.2 Evaluate business dealings with friends, family, or competitors
- 20.3 Evaluate pricing and sales incentives
- 20.4 Evaluate potential environmental damage of agriculture practices
- 20.5 Evaluate sustainable agriculture

21.0 INVESTIGATE APPROVED BIOTECHNOLOGY TECHNIQUES

- 21.1 Specify methods and requirements by which an organism's genetic code can be altered using biotechnology techniques
- 21.2 Explain the process of embryo transfer techniques
- 21.3 Demonstrate propagation techniques using tissue culture
- 21.4 Detect biotechnology techniques that have contributed to improved health
- 21.5 Explore methods of using biotechnology to improve production
- 21.6 Justify the purposes and processes of growth regulators
- 21.7 Describe how scientists continue to investigate and critically analyze DNA cloning
- 21.8 Express the use of jumping genes
- 21.9 Examine careers in the biotechnology industry
- 21.10 Analyze how specific cultural and/or social issues promote or hinder scientific advancements
- 21.11 Report new agricultural products developed as a result of advances in technology

22.0 INVESTIGATE APPROVED PRACTICES OF DISEASE CONTROL

22.1 Differentiate between common diseases
22.2 Assess symptoms of common diseases and parasites
22.3 Evaluate economic impact of diseases on production
22.4 Compare methods by which diseases are spread
22.5 Evaluate the most economical and environmentally safe disease control and prevention methods
22.6 Conduct an investigation on an infected field/organism
22.7 Record observations, notes, sketches, questions, and ideas during the investigation
22.8 Propose corrective actions needed to treat an infected field/organism

23.0 INVESTIGATE APPROVED NUTRITIONAL PRACTICES

23.1 Determine the essential nutrients for organisms and describe their importance
23.2 Research common nutrient deficiency symptoms and treatment options
23.3 Recommend nutrient and quantity requirements
23.4 Evaluate diagnosis, treatment, and prevention of nutrient deficiency
23.5 Inspect supplemental and additive ration/fertilizer composition
23.6 Prepare tissue samples for testing and diagnosis
23.7 Test methods of fertilizer/nutrient application
23.8 Compare the relationship between nutrient practices and yield amounts

24.0 ANALYZE THE INTERACTION AMONG ENVIRONMENTAL AND NATURAL RESOURCES SCIENCES

24.1 Evaluate environmental and natural resource sciences
24.2 Demonstrate how dynamic processes such as weathering, erosion, and sedimentation relate to redistribution of materials in the earth system
24.3 Investigate soil morphology
24.4 Illustrate land-use and water-use planning
24.5 Explain factors that impact current and future water quantity and quality including surface, ground, and local water issues
24.6 Define bio-fuels and how they are affecting the environment
24.7 Describe how human activities and natural causes can lead to pollution
24.8 Evaluate the effectiveness of conservation practices on environmental quality and biodiversity
24.9 Research careers in environmental sciences

25.0 INVESTIGATE ENVIRONMENTAL AND ECONOMICAL IMPACTS OF INTEGRATED PEST MANAGEMENT OPTIONS

25.1 Classify common pests, including insects and noxious weeds
25.2 Evaluate economic impact of pests on plant production
25.3 Predict methods by which pests spread
25.4 Recognize signs of pest damage
25.5 Identify thresholds created for specific pests
25.6 Select and propose the most economical and environmentally safe pest control method
25.7 Identify GMO crops and their role in the agriculture industry.
25.8 Read and interpret pesticide labels
25.9 Select and wear protective clothing for applying pesticides
25.10 Apply pesticide effectively

26.0 DEMONSTRATE AGRISCIENCE MECHANIC APPLICATIONS

26.1 Demonstrate personal and group safety
26.2 Develop a bill of materials for a specific task
26.3 Develop a structural plan for a specific task
26.4 Demonstrate appropriate wood fabrication techniques
26.5 Demonstrate appropriate metal fabrication techniques
26.6 Demonstrate appropriate oxy-fuel cutting techniques used in agriculture
26.7 Demonstrate appropriate plasma cutting techniques used in agriculture
26.8 Demonstrate appropriate plumbing fabrication techniques used in agriculture
26.9 Demonstrate appropriate safe connection of electrical components including motors, timers, and values in both high and low voltage circuits used in agriculture
26.10 Demonstrate appropriate concrete and masonry practices commonly used in agriculture
26.11 Demonstrate operation and maintenance of appropriate mechanical systems used in agriculture
26.12 Demonstrate service and repair of appropriate mechanical systems
26.13 Demonstrate appropriate land measurement and construction techniques commonly used in agriculture which are to include optical, laser, and global positioning satellite systems
26.14 Demonstrate principles and applications of various engines and machinery used in agriculture

Laboratory-Based Integrated Science II
Power, Structural, & Technical Systems - Option E
CIP NO. 01.0100.60

These standards should be taught throughout the Agriscience program and will affect how the other standards are taught.

27.E APPLY PHYSICAL SCIENCE PRINCIPLES TO ENGINEERING APPLICATIONS WITH MECHANICAL EQUIPMENT, STRUCTURES, BIOLOGICAL SYSTEMS, LAND TREATMENT, POWER UTILIZATION, AND TECHNOLOGY

27.1e Relate power generation to energy sources

- 27.1.1e Identify petroleum sources (e.g., gasoline, diesel)
- 27.1.2e Identify alternative sources (e.g., ethanol, bio-diesel, air, wood, geothermal, solar)
- 27.1.3e Compare environmental impact of energy sources
- 27.1.4e Compare efficiency of energy source
- 27.1.5e Compare characteristics of energy sources
- 27.1.6e Discuss efficiency of systems (e.g., fuel cells, chemical, wind, hydro, nuclear, electric, mechanical, solar, biological)

27.2e Apply principles of lubricants to sort and classify lubricants

- 27.2.1e Classify lubricants and determine applications
- 27.2.2e Identify viscosity and strengths of lubricants
- 27.2.3e Describe properties of lubricants

28.E APPLY PRINCIPLES OF OPERATION AND MAINTENANCE TO MECHANICAL EQUIPMENT, STRUCTURES, BIOLOGICAL SYSTEMS, LAND TREATMENT, POWER UTILIZATION, AND TECHNOLOGY

28.1e Perform scheduled service routines to maintain machinery and equipment

- 28.1.1e Lubricate machinery and equipment
- 28.1.2e Ensure presence and function of safety systems and hardware
- 28.1.3e Service electrical systems
- 28.1.4e Perform machine adjustments (e.g., belts, drive chains)
- 28.1.5e Service filtration systems
- 28.1.6e Maintain fluid levels
- 28.1.7e Maintain vehicle, machinery and equipment cleanliness and appearance

28.1.8e Maintain fluid conveyance components, (e.g., hoses and lines, valves, nozzles)
28.1.9e Design a preventive maintenance schedule
28.1.10e Identify causes of malfunctions and failures
28.1.11e Calibrate metering, monitoring, and sensing equipment

28.2e Observe rules of the road to operate machinery and equipment
28.2.1e Describe function of machine controls and instrumentation
28.2.2e Perform appropriate start-up procedures
28.2.3e Select proper machine(s) for specific task(s)
28.2.4e Safely operate equipment
28.2.5e Perform pre-operation inspection
28.2.6e List applicable laws for on- and off-highway operation

29.E APPLY PRINCIPLES OF SERVICE AND REPAIR TO MECHANICAL EQUIPMENT, STRUCTURES, BIOLOGICAL SYSTEMS, LAND TREATMENT, POWER UTILIZATION, AND TECHNOLOGY

29.1e Troubleshoot problems and evaluate performance to service and repair the components of internal combustion engines
29.1.1e Describe principles of operation
29.1.2e Identify engine systems and components
29.1.3e Analyze and troubleshoot engine
29.1.4e Perform overhaul procedures
29.1.5e Evaluate engine performance through post-rebuild testing

29.2e Follow manufacturers' guidelines to service and repair power transmission systems
29.2.1e Describe features, benefits, and applications of various power transmission systems
29.2.2e Describe principles of operation of various power transmission systems
29.2.3e Perform calculations involving speed, torque and power relationships
29.2.4e Describe features, benefits, and applications of mechanical transmission components (e.g., belts, chains, gears, bearings, seals, universals)
29.2.5e Inspect, analyze, and repair hydrostatic transmissions
29.2.6e Inspect, analyze, and repair differentials and final drives
29.2.7e Inspect, analyze, and repair clutches and brakes
29.2.8e Inspect, analyze, and repair gear-type transmissions including power shift
29.2.9e Inspect, analyze, and repair auxiliary drives

29.3e Evaluate performance and check maintenance manuals to service and repair hydraulic systems

- 29.3.1e Describe features, benefits, and applications of types of hydraulic systems
- 29.3.2e Describe physical principles of operation
- 29.3.3e Interpret symbols and schematic drawings
- 29.3.4e Describe the application and operation of major components
- 29.3.5e Inspect, analyze, and repair hydraulic components (e.g., pumps, valves)
- 29.3.6e Inspect, analyze, and repair fluid conveyance components (e.g., hoses, lines)
- 29.3.7e Evaluate system cleanliness
- 29.3.8e Identify hydraulic fittings and ports

29.4e Troubleshoot from schematics to service vehicle electrical systems

- 29.4.1e Describe features and applications of electrical systems
- 29.4.2e Interpret symbols and wiring diagrams
- 29.4.3e Test and troubleshoot electrical systems and components (e.g., battery, charging, starting, lighting, instrumentation, accessories)
- 29.4.4e Troubleshoot and install instrumentation and data acquisition system (e.g., Global Positioning System (GPS), spraying, planting, harvesting monitors)
- 29.4.5e Diagnose and repair control systems and sensors (e.g., engine, transmission, implement)

29.5e Use company diagrams and schematics to service vehicle heating and air conditioning systems

- 29.5.1e Describe physical principles of operation
- 29.5.2e Interpret symbols and diagrams
- 29.5.3e Test, troubleshoot, and replace heating and air-conditioning components (e.g., compressor, expansion valve, receiver dryer, pump, hoses)
- 29.5.4e Evacuate and charge air conditioning systems

29.6e Check performance parameters to service and repair steering, suspension, traction, and vehicle performance systems

- 29.6.1e Evaluate traction, ballasting, and weight transfer
- 29.6.2e Evaluate vehicle stability
- 29.6.3e Determine optimum vehicle performance, e.g., horsepower management, fuel efficiency
- 29.6.4e Troubleshoot, adjust, and repair suspension systems
- 29.6.5e Inspect and repair steering systems

29.7e Use tools in the workplace to demonstrate safe use and proper skills with construction/fabrication hand tools

- 29.7.1e Demonstrate proper use of measurement and layout tools
- 29.7.2e Apply proper use of measurement and layout tools in construction/fabrication of an actual project
- 29.7.3e Demonstrate safe and proper techniques in using hand and power tools in construction/fabrication
- 29.7.4e Demonstrate hand and power tool use to construct/fabricate an actual project according to blueprints or plans
- 29.7.5e Identify and demonstrate proper hand and power tool maintenance procedures

30.E EXERCISE BASIC SKILLS IN BLUEPRINT AND DESIGN DEVELOPMENT TO CREATE SKETCHES, DRAWINGS AND PLANS

30.1e Use computer skills to develop simple sketches and plans

- 30.1.1e Use current technology to develop simple plans and sketches
- 30.1.2e Identify symbols and drawing techniques used to develop simple plans and sketches
- 30.1.3e Use scale measurement and dimension to develop simple plans and sketches

31.E READ AND RELATE STRUCTURAL PLANS TO SPECIFICATIONS AND BUILDING CODES

31.1e Examine blueprints and local codes to develop a logical construction plan

- 31.1.1e Identify parts of a plan or blueprint
- 31.1.2e Identify criteria for different views of a plan or blueprint
- 31.1.3e Locate elements of a construction plan and develop a construction plan
- 31.1.4e Identify local code enforcement agencies and procedures
- 31.1.5e Read and interpret local code information
- 31.1.6e Complete permit applications

32.E EXAMINE STRUCTURAL REQUIREMENTS TO ESTIMATE PROJECT COSTS

32.1e Use bids and billing information to develop a complete materials list and project cost estimate

- 32.1.1e Identify materials used in agricultural construction/fabrication
- 32.1.2e Explain proper criteria for material use
- 32.1.3e Identify elements of project cost estimate (materials, labor, administrative, etc.)
- 32.1.4e Explain selection process of all construction materials
- 32.1.5e Estimate and select type and quantities of material and other costs associated with a specified project plan
- 32.1.6e Prepare a bid package for a planned project

33.E DEVELOP SKILLS REQUIRED TO USE CONSTRUCTION/FABRICATION EQUIPMENT AND TOOLS

33.1e Use tools in the workplace to demonstrate safe use and proper skills with construction/fabrication hand tools

- 33.1.1e Demonstrate proper use of measurement and layout tools
- 33.1.2e Apply proper use of measurement and layout tools in construction/fabrication of an actual project
- 33.1.3e Demonstrate safe and proper techniques in using hand and power tools in construction/fabrication
- 33.1.4e Demonstrate hand and power tool use to construct/fabricate an actual project according to blueprints or plans
- 33.1.5e Identify and demonstrate proper hand and power tool maintenance procedures

34.E PLAN, IMPLEMENT, MANAGE, AND/OR PROVIDE SUPPORT SERVICES TO FACILITY DESIGN AND CONSTRUCTION; EQUIPMENT DESIGN, MANUFACTURE, REPAIR, AND SERVICE; AND AGRICULTURAL TECHNOLOGY

34.1e Design machinery and equipment including vehicles, implements, building, and facilities (e.g., feeding, feed storage)

- 34.1.1e Analyze site/equipment/permit requirements
- 34.1.2e Develop drawings
- 34.1.3e Estimate material needs and costs
- 34.1.4e Operate Computer Aided Drafting Design (CADD) Software

34.2e Follow architectural and mechanical plans to construct buildings and facilities

- 34.2.1e Identify and select appropriate building materials
- 34.2.2e Install plumbing equipment and fixtures
- 34.2.3e Construct with wood and metal
- 34.2.4e Install electrical wiring components and fixtures
- 34.2.5e Paint or protect with coatings
- 34.2.6e Insulate facility
- 34.2.7e Install fencing
- 34.2.8e Install glass, ridged plastic panels and/or film plastic
- 34.2.9e Construct with concrete, stone, and brick

35.E USE THE VARIETY OF TOOLS AVAILABLE IN COMPUTER SYSTEMS TO ACCOMPLISH FAST, ACCURATE PRODUCTION IN THE WORKPLACE

35.1e Identify and explain various types of hardware systems to show their applications potential

35.1.1e Identify and describe individual components of each system
35.1.2e Discuss various types of diagnostic equipment
35.1.3e Be able to show aptitude in use of various equipment
35.1.4e Demonstrate competency on cable through put and set up

36.E USE AVAILABLE POWER SOURCES TO PLAN AND APPLY CONTROL SYSTEMS

36.1e Measure with selected instruments to demonstrate knowledge of basic electricity

36.1.1e Show proficiency in use of various meters
36.1.2e Discuss importance of and techniques for grounding
36.1.3e Show understanding of codes and regulations
36.1.4e Discuss various energy sources

36.2e Reference electrical drawings to design, install, and troubleshoot control systems

36.2.1e Develop and read schematic drawings for a control system
36.2.2e Identify and describe uses of various components of control systems; i.e., transistors, relays, HVAC, logic controllers
36.2.3e Discuss the importance of maintenance schedules
36.2.4e Identify system performance problems and apply troubleshooting techniques

37.E EXPLAIN GEOSPATIAL TECHNOLOGY TO DEMONSTRATE ITS APPLICATIONS

37.1e Employ appropriate techniques to demonstrate application of GIS/GPS systems principles

37.1.1e Explain the concept and principles
37.1.2e Describe equipment
37.1.3e List techniques used
37.1.4e Explain the application of GIS/GPS systems with map development output

37.2e Use computer applications to produce maps that reflect surveying and mapping principles

37.2.1e Understand and use various equipment
37.2.2e Perform survey and produce map using computer techniques

37.3e Select an area of personal expertise to demonstrate knowledge of end applications

37.3.1e Apply knowledge and experience to a specific application or project to show competency; i.e., calibration, volumetric controlling, electrical design